

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) A spark plug comprising:  
a center electrode having a tip;  
a ground electrode having a center electrode-opposed surface facing the tip of said center electrode;  
a noble metal member having a given length and a first and a second end opposed to each other through the length, said noble metal member being joined at the first end to the center electrode-opposed surface of said ground electrode by laser welding so as to oppose the second end to the tip of said center electrode through a spark gap; and  
a fused portion that forms a weld of said noble metal member and said ground electrode formed by materials of said ground electrode and said noble metal member melted together,  
wherein a sectional area of said noble metal member traversing the length thereof is greater than or equal to  $0.1\text{mm}^2$  and smaller than or equal to  $0.6\text{mm}^2$ ,  
wherein an unfused sectional area percentage that is a percentage of a sectional area of an unfused portion of the first end of said noble metal member within a range of a sectional area of said noble metal member closest to said fused portion traversing the length of said noble metal member is less than or equal to 50%, and  
wherein a melt angle that is an angle which a line extending through said fused portion along a maximum depth of said fused portion makes with the center electrode-opposed surface of said ground electrode is less than or equal to  $60^\circ$ .
2. (original) A spark plug as set forth in claim 1, wherein if a point at which the line extending along the maximum depth of said fused portion intersects an outer

surface of said fused portion is defined as an intersection  $F$ , and a distance between the intersection  $F$  and the center electrode-opposed surface of said ground electrode is defined as an intersection-to-surface distance  $y$ , the intersection  $F$  is located within a range of -0.2mm to 0.3mm where when the intersection  $F$  is located outside the center electrode-opposed surface of said ground electrode, the intersection-to-surface distance  $y$  is expressed in a plus value (+), and when the intersection  $F$  is located inside the center electrode-opposed surface of said ground electrode, the intersection-to-surface distance  $y$  is expressed in a minus value (—), and wherein said melt angle is less than or equal to  $(30 + 100y)^\circ$ .

3. (original) A spark plug as set forth in claim 1, wherein if a width of a portion of said noble metal member closest to said fused portion is defined as  $D$ , the maximum depth of said fused portion is less than or equal to  $1.4D$ .

4. (original) A spark plug as set forth in claim 1, wherein said noble metal member is made from one of a first material containing a main component of 50Wt% or more of Pt and an additive of at least one of 25 Rh, Ir, Os, Ni, W, Pd, and Ru and a second material containing a main component of 50Wt% or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.

5. (original) A spark plug comprising:  
a metal shell;  
a center electrode retained in said metal shell to be insulated from said metal shell, said center electrode having a tip exposed outside said metal shell;  
a ground electrode installed on said metal shell, said ground electrode having a tip which has a center electrode-opposed side surface facing the tip of said center electrode and an end surface; and  
a noble metal member that is at least partially embedded in the end surface of said ground electrode and joined to said ground electrode by laser welding through a

fused portion that forms a weld of said noble metal member and said ground electrode formed by materials of said ground electrode and said noble metal member melted together, said noble metal member having a tip projecting from the center electrode-opposed side surface of said ground electrode toward said center electrode so as to define a spark gap between the tip of said noble metal member and the tip of said center electrode.

6. (original) A spark plug as set forth in claim 5, wherein if a width of a portion of said noble metal member closest to said fused portion in a direction perpendicular to the end surface of said ground electrode is defined as  $D1$ , a depth of a portion of said noble metal member embedded in the end surface of said ground electrode is greater than or equal to  $0.5D1$ .

7. (original) A spark plug as set forth in claim 5, wherein said noble metal chip has a length, and a sectional area of said noble metal member traversing the length thereof is greater than or equal to  $0.1\text{mm}^2$  and smaller than or equal to  $0.6\text{mm}^2$ .

8. (original) A spark plug as set forth in claim 5, wherein if a width of a portion of said noble metal member closest to said fused portion in a direction perpendicular to the end surface of said ground electrode is defined as  $D1$ , a width of said portion of said noble metal member in a direction parallel to the end surface of said ground electrode is defined as  $D2$ , a width of said fused portion is defined as  $N$ , and a maximum depth of said fused portion is defined as  $H$ , the maximum depth  $H$  is smaller than or equal to  $2D1$ , and the width  $N$  is smaller than or equal to  $2.5D2$ .

9. (original) A spark plug as set forth in claim 8, wherein a depth of a portion of said noble metal member embedded in the end surface of said ground electrode is greater than or equal to  $0.5D1$ .

10. A spark plug as set forth in claim 5, wherein said noble metal member is made from one of a first material containing a main component of 50Wt% or more of Pt and an additive of at least one of Rh, Ir, Os, Ni, W, Pd, and Ru and a second material containing a main component of 50Wt% or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.

11. (withdrawn) A method of fabricating a spark plug comprising the step of:  
preparing a center electrode;  
placing a ground electrode so as to have a center electrode-opposed surface facing said center electrode through a spark gap;  
preparing a noble metal member having a length and a first end and a second end opposed to each other through the length; and  
joining said noble metal member at the first end to the center electrode-opposed surface of said ground electrode by radiating a laser beam toward a corner defined by a side wall of said noble metal member continuing from the first end and the center electrode-opposed surface of said ground electrode from a direction diagonal to the center electrode-opposed surface to fuse a portion of said noble metal member and a portion said ground electrode, thereby forming a weld between said noble metal member and said ground electrode.

12. (withdrawn) A method of fabricating a spark plug comprising the step of:  
preparing an assembly of a center electrode and a ground electrode, the center electrode being installed within a metal shell in an electric insulating fashion with a tip projecting from the metal shell, the ground electrode being installed on the metal shell with a tip having a center electrode-opposed side surface facing the tip of said center electrode and an end surface;  
forming a groove in the end surface of the ground electrode; and  
embedding a noble metal member at least partially embedded in the groove in the end surface of the ground electrode with a tip projecting from the center electrode-

opposed side surface of the ground electrode toward the tip of the center electrode and joining the noble metal member to the ground electrode by laser welding to form a fused portion that is a weld of the noble metal member and the ground electrode made up of materials of the ground electrode and the noble metal member melted together.

13. (New) A spark plug as set forth in claim 1, further comprising a metal shell having a thread formed in an outer periphery thereof, a porcelain insulator installed in said metal shell to have a tip projecting from an end of said metal shell, said porcelain insulator having a length and an inner chamber extending along the length thereof, wherein said center electrode is disposed within the inner chamber of said center electrode to have a tip projecting from the tip of said porcelain insulator, and wherein said ground electrode has an L-shape which includes a base end welded to the end of said metal shell and a tip, the tip of said ground electrode having a side surface defining the center electrode-opposed surface which faces the tip of said center electrode through the spark gap.

14. (New) A spark plug as set forth in claim 5, further comprising a metal shell having a thread formed in an outer periphery thereof, a porcelain insulator installed in said metal shell to have a tip projecting from an end of said metal shell, said porcelain insulator having a length and an inner chamber extending along the length thereof, wherein said center electrode is disposed within the inner chamber of said center electrode to have a tip projecting from the tip of said porcelain insulator, and wherein said ground electrode has an L-shape which includes a base end welded to the end of said metal shell and a tip, the tip of said ground electrode having a side surface defining the center electrode-opposed surface which faces the tip of said center electrode through the spark gap.